moderately humid climates (which are the only climates I have thus far experienced). Just how and why fluctuations of water-level affect vegetation is a problem which belongs to ecology rather than to phytogeography, and it would require too much space to discuss it here.

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FOSSIL FLOWERS AND FRUITS

BY T. D. A. COCKERELL

The Miocene shales at Florissant, Colorado, are remarkably rich in flowers and fruits, some of which have already been described. Many others have remained unpublished, because I found it extremely difficult to determine their generic relationships with any degree of certainty. Some years ago, I took a series to Cambridge University in England, where they were much admired, but eventually returned to me with the remark that no one there felt able to describe them. I have been very unwilling to publish species of "*Antholithes*," "*Carpolithes*," etc., which could not even be referred definitely to particular families; but it is possible that by ignoring these specimens we may be missing some important evidence. Tertiary plants are nearly always referred to living genera, and it is at least certain that few if any distinct genera of plants have originated since the Miocene. It is quite a different question, however, whether any have become extinct since that time, and indeed it is practically certain that many genera have disappeared during the Tertiary. We know genera like *Sequoia*, which formerly were widespread and abundant, but now are restricted to small areas. The important genus *Ginkgo* would have disappeared entirely had it not been taken into cultivation. It is therefore quite reasonable to look for extinct genera in the Miocene, and if these really exist among our fossils, it is probable that the fruits and flowers will best indicate them. For such reasons as these it may be worth while to publish descriptions of unclassified flowers and fruits, which may be introduced as "*Antholithes*" and "*Carpolithes*," and perhaps correctly classified at some later date.

To propose a new generic name for each of these organisms would only create confusion, unless the author were so skilled in botanical taxonomy that he could say positively, no such plant as this exists today. I certainly do not possess such knowledge, but it may be that the inability of any and all botanists to recognize certain types will after a time appear to justify new generic names.

1. **Carpolithes macrophyllus** n. sp.

Fruit apparently consisting of woody follicles about 2.75 mm. long, so far as can be seen like those of *Lyonothamnus*; sepals four, persistent, about 16 mm. long, 4 broad in middle, elongate-lanceolate, apparently entire, with a single strong median vein and an irregular reticulate venation of the camtodrome type. The sepals are imperfect in various degrees, but enough is visible to permit a restoration as shown in the drawing.

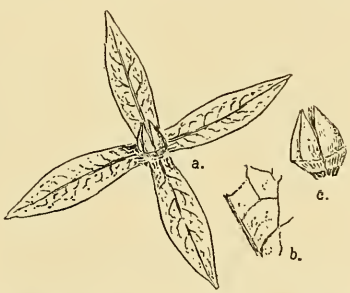

FIG. 1. *Carpolithes macrophyllus*. *a*, Whole fossil, the edges of the calyx-lobes restored; *b*, detail of venation; *c*, fruit.

Can this be Cunoniaceous? The follicles and persistent sepals agree, and while the hypanthium is 5-lobed in *Lyonothamnus*, it is 4 or 5-lobed in *Weinmannia* and other genera. I do not know any genus in which the sepals resemble those of the fossil, however. In connection with the Cunoniaceæ, it is to be remarked that *Lyonothamnus*, now restricted to the islands off the coast of California, must have been more widely distributed during the Tertiary. Its foliage is extraordinarily like that of the Proteaceous *Banksia*, and if it has occurred as a fossil it has probably been referred to that genus.

Among the described fossils, *C. macrophyllus* much resembles *Buettneria perplexans* Ckll., also from Florissant. *B. perplexans* has a five-lobed calyx, the lobes or sepals about 9.5 mm. long.

C. macrophyllus was found at Station 14, Florissant (*W. P. Cockerell*). The mollusc *Planorbis florissantensis* occurs on the same slab, about 25 mm. from the plant.

REVIEWS

Scott's Evolution of Plants*

This is one of the most fascinating and, at the same time, illuminating "popular" books on science that has appeared in some time; the style has a distinct literary value, and the statements have clearness and lucidity such as only a master can command. The scope of the book is much more restricted than the title indicates, for the subject of the evolution of plants is treated chiefly with reference to the fossil evidence (p. 20). The questions considered are (p. 21): (1) The evolution of the true flowering plants or angiosperms (Chapters II and III); (2) The evolution of the seed-plants generally (Chapter IV); (3) The evolution of the great groups of the higher cryptogams, *i. e.*, of those spore-plants which share with the seed-plants the possession of a vascular system (wood and bast) (Chapters V to VII).

It is of interest to note, in passing, the order of topics, as given above, which is a direct reversal of the order of evolutionary development. In view of the claim, now so frequently and emphatically urged, that any method of treatment of the subject matter of botany that departs from the supposed order of phylogeny is undesirable and "illogical," it is instructive to note the entire success of the author's inverse order of treatment. One could hardly claim, in seriousness, that the reader loses anything of either clearness or accuracy, by approaching, even for the first time, the history of development as here recorded.

Every specialist bemoans the neglect of his own corner by those who are absorbed in other corners, but it is doubtless

* Scott, Deunkinfield Henry. The Evolution of Plants pp. 1–256. *f. 1–25.* Henry Holt and Co., New York, and Williams and Norgate, London. 1911. (A volume of The Home University Library of Modern Knowledge.)